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ABSTRACT

This paper describes a tentative model to assist in conceptualization of the dynamics of adult social-cognitive development based on Piaget's and Riegel's thought, gerontological studies, and dialectical theory. The proposed model possesses several qualities: (1) it derives from the concept of intelligence as an adaptive biological entity; (2) it allows for exploration of the social cognitive growth of each person in an interaction, simultaneously; (3) both the intrapersonal and interpersonal dialectical processes can be explored; (4) logical operational development is considered a function of social experience; and (5) the model may be used to understand adult thinking in key areas of work, family relations and personal integrity. A pretest which utilizes analyses of adult dialogs is described, and further applications and research approaches are suggested. (PJC)

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Adult Intellectual Development As Social-cognitive Growth: A Model

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The behavioral sciences have just begun to study what some lay persons perceive as the most important global element of adult development: that increasing depth, richness, and complexity noted in mature interpersonal and social relations. Attempts to study adult developmental progressions have generally examined either social or cognitive changes as isolated from one another. For example, Erikson's accounts of adult development tasks such as intimacy, generativity, and integrity (1968) suggest globally important changes, but are difficult to relate to cognition in adulthood. Recently, Schaie (1977-78) described a stage theory of adult cognitive functioning which suggested that cognitive processes are differentially organized and expressed during periods labelled "achieving," "responsible," "executive," and "reintegrated." Schaie did not go on to describe either the organization of the (apparently) social-cognitive processes underlying these adult stages of development, or their genesis.

Descriptions of adult social-cognitive development would increase the meaningfulness of behavioral studies of adult personality and cognition. They would provide a means of measuring adult intellectual competence and adaptivity based on ecologically valid criteria. Knowledge of adult social-cognitive development would provide a means of conceptualizing adult development as a unified whole. The study of adult social cognition also appears to be an area where Eriksonian concepts, Piagetian concepts, and dialectical analysis--3 important theoretical positions--might be explored together.

In order to assist in conceptualization of the dynamics of adult social-cognitive development, this paper will describe a tentative model for that process. The model is the result of analysis and synthesis of the literature concerning: adult and gerontological studies; Piagetian theory; dialectical theory; and selected data from exploratory work. It is also a result of explorations concerning the epistomology of physical relativity. A complete discussion of these topics can be found in "Adult Intellectual Development as Social-cognitive Growth: A Relativistic Model Incorporating Concepts of Riegel and Piaget", a monograph available from the author in prepublication form.

The proposed model possesses several qualities; (1) it derives from the concept of intelligence as an adaptive biological entity; (2) it utilizes Piagetian theory; (3) it utilizes dialectical theory; (4) it allows for exploration of the social cognitive growth of each person in an interaction--simultaneously; (5) the intrapersonal dialectical processes can be explored (6) the interpersonal dialectical processes can be explored; (7) logical operational development is considered a function of social experience; (8) individual social behavior is considered a function of logical operational development plus social experience; (9) the model may be sued to predict interpersonal relations in a group; and (10) the model may be used to understand adult thinking in key areas of work, family relations, and personal integrity.

The purpose of this paper is to describe some proposed operations of social cognition in adults and to detail the dynamics of changes in social-cognitive structures when adults experience social interactions.

Lifespan Intellectual Development

Studies which describe intellectual development in adulthood and old age as part of the continuum of intellectual development in childhood and adolescence will be considered here. The usual presumption with such studies is that one of the following events occurs: 1) adults' and young persons' intellectual abilities do not differ in quality or characteristics from each other; adults generally decline in performance and receive quantitatively lower scores; 2) adults' and younger persons' intellectual abilities do not differ in quality or characteristics; adults maintain whatever level of performance they reached in adolescence; or 3) adults' and younger persons' intellectual abilities do not differ from each other in quality or characteristics; adults perform better than younger persons on tests. The three basic positions seem to underlie studies of adult intelligence whether those studies define intelligence "performance on IQ tests", "performance in problem solving", or "performance on Piagetian tasks", the three main types of measures used in research on intellectual abilities. Depending to some degree on the nature of the experimental design--cross-sectional, longitudinal, or cross-sequential--results confirm any one of the three assumptions, with the third being the least often confirmed. Overviews of the research findings in this field can be found in Birren and Schaie (1977), particularly in the chapters by Arenberg and Robertson-Tchabo, by Botwinick, and by Rabbitt. Reviews of Piagetian research findings are available in the article by Papalia and Bielby (1974) and the monograph by Muhs, Hooper, and Papalia-Finlay (1977). Consequently, only examples of the types of findings which illustrate each of the three dynamics will be presented.

The most commonly found conceptualization is that of decline in abilities with age. Sanders, et al, (1966) administered a Piagetian task assessing conservation of surface operations to 155 subjects from the age of 20 to over 60, using the task originally developed by Piaget for use with children (Inhelder and Piaget 1958;1964). Persons in the 20 to 39 year old group demonstrated a success rate of around 84%; those in the 40 to 59 year old group demonstrated a rate of about 72%; the oldest group, 60 and over, demonstrated a success rate of only 24%. Results were interpreted in terms of decline in ability with age. Using a composite of Primary Mental Abilities scores obtained in a population of 500 persons between the ages of 20 and 70 years, Schaie (1959) demonstrated a rise in scores between ages 20 and 35, a plateau from 35 to about 45, and a sharp decline from 46 to 70. Of course many variables can be examined to partially explain the apparent decline with age. Many studies have found health to be a factor, often one coupled with institutionalization and the lack of stimulation it involves (for example, Rubin, 1973; Chap and Sinnott 1977-78; Kleemeier, 1962). Education is sometimes associated with the age differential in performance (Graves, 1972; Sinnott, 1975) as are fatigue (Furry and Baltes, 1973), sex (Papalia, et. al., 1973; Sinnott and Guttmann, 1977; Graves, 1972), task instructions (Looft & Bartz, 1969), and motivation (Rabbitt, 1977). Still, these factors failed to completely eliminate age difference. Eventually, the cross-sectional technique itself was criticized (for example, Schaie, 1970 and 1973; Baltes and Schaie, 1977) for failing to take cohort differences in just such factors into account in determining "decline". Cross-sequential techniques appear to have explained away a considerable amount of "decline", although the controversy still rages over the legitimacy of their use (see Horn and Donaldson, 1977).

The second commonly found conceptualization is that adults and the elderly possess the same types of abilities as the young--no more, and no less. This position has been alluded to by Piaget (1972) and has been the conclusion reached by some of the cross-sequential type studies (Schaie, 1965; Baltes, 1968). In some of the Piagetian studies done with adults and the elderly (for example, Storck, et.al., 1972) success rates for adults were as high as those for adolescents. The Wechsler Verbal test scores usually held with age (Botwinick, 1977). Owens (1966) reported a plateau in Army Alpha Test scores. The plateau result, however, is noted far less frequently in the literature than the decline result. Some of the plateau conclusions were reached by means of the cross-sequential method, and are contested for that reason. The plateau effect has also been attributed to the selective dropout of low-scoring subjects in longitudinal studies (for example, Baltes, Schaie, and Nardi, 1971). The plateau is sometimes turned into a decline during terminal drop (Riegel and Riegel, 1972); since death can be seen as a normal part of aging, many authors reject plateau findings which result from controls on the health status (Botwinick, 1977).

The third and least commonly found assumption is that of increase in abilities with age. Horn and Cattell (1967), for example, demonstrated that the largely verbal crystallized abilities scores of their subjects increased with age. In a lifespan study of conservation abilities (Papalia, 1972), the group manifesting the best performance was the 55-64 year old group. These results can again be criticized because they may reflect selective dropout or an increase in a restricted, specific area of operational functioning rather than in overall operational functioning.

The impression obtained by reviewing the literature on abilities and aging is tht investigators have focused on the second half of the three assumption statements (i.e., does ability increase, decrease, or stay the same with age?) while paying little attention to the first half of the assumption, that the abilities of adults and the elderly are qualitatively like those of their younger counterparts. By contrast, in popular literature much time is spent discussing the increased wisdom and understanding that come with the experiences of adulthood with its responsibilities, and from old age with its changes in perspective. The fruits of such experience would hardly be fully tapped by traditional abilities assessment tasks which were, after all, designed either for children or for very young adults. From the comments of some elderly test-takers themselves (Sinnott and Guttmann, 1978 a & b) the traditional tasks are viewed as either "senility tests" or as insults to their intelligence and infringements on their limited time. How might adult and elder intellectual abilities be appropriately tested if investigators truely believed that significant intellectual development takes place after early adulthood? Is intelligent behavior for mature adults necessarily limited to scores on the WAIS or the PMI or on Piagetian tasks? Can ecologically valid tasks be developed and validated for adults along the lines that Hultch and Hickey suggest (1977), not against other traditional tests or against school performance, but against the criteria of success in adult life? What might stages of adult, adaptive operational development be like? Might they go beyond the skills important to the young?

A small number of investigators and theorists have begun to consider these questions, among them Riegel (1976), Piaget (1972),

Clayton (1975), Schaie (1977-78), Sinnott (1975) and Cyr and Stone (1977-78). The first consideration was of qualitative age differences in performance on traditional measures of ability. The overall result of that attempt was to describe the quality of mature adult responses as different from that of either children or elders (who tended to give less complex responses). A complete review of these findings is available in Birren and Schaie (1977), Papalia and Bielby (1974), and Muhs, Hooper, and Papalia-Finlay (1977). This qualitative analysis at least gave evidence for mature adult development, but it also indicated decline in old age. Since analyses were mainly cross-sectional, the criticism of design applied. More revolutionary suggestions were eventually made for testing of intellectual abilities more unique to adult development and to development in old age.

Schaie (1977-78; and 1977) has suggested that abilities in adulthood be measured by means of WAIS-type skills that conform to the needs and demands of the tasks of that life period. For example, cognitive abilities for the achieving period (teens-20's) would be selected for their relevance to acquiring job-related skills while the abilities of the responsible stage (30's-40's) would relate to needs of personal independence and beginning a family. A person in the executive stage (middle age) would best be tested by traditional cognitive tasks that bear on his/her ability to take responsibility for societal systems, while tasks for the old adult would relate to the reorganization of life experiences into a coherent whole. Schaie's proposed scheme relates adult intellectual ability to age-typical tasks (typical, at least, for Western industrial society) but utilizes traditional measures to do so.

In another proposed approach, Piaget (1972) has suggested that adults be tested using forms of his tasks that relate in content to the typical everyday activities of the testee in order to measure true competence in adults. This approach was tried by Sinnott who administered concrete and formal operations tasks to persons in their 30's and over 60 (Sinnott, 1975), and to a large representative sample of persons over 60 (Sinnott and Guttmann, 1978). While the elders did as well on the tasks as some college-age samples, and did much better using everyday forms than using the traditional forms, their performance on the tasks was not strongly related to their ability to make decisions in everyday life. Arlin (1976) noted that Piaget's comments (1972) do not convince one that his model is adequate to explain mature, creative adult thought development. The lack seems less in the nature of Piaget's model than in its application to adult development, in which its essential epistomological features have generally been ignored. If cognition is an adaptive process of structuring experience for the child (Piaget, 1971) why should it be less than that for the adult and elder? For example, how does one come to "know" other persons, who frequently change their pattern of interaction with a knower? How does the adult know the social institutions which are constantly evolving--and know them better as life goes on? What is the epistomology of the constantly changing event?

The dialectical theory of Riegel (1973) offers another possible method of creating valid measures of adult intellectual abilities, although it was not originially formulated for that purpose. If lifespan development occurs as a result of successive coordinations of continuously developing conflicts generated by mismataches in developmental dimensional progressions, one might specualte that an intellectual component is needed to bring about the

synthesis between the conflicting dimensions. Riegel himself postulated a fifth stage of "dialectical operations" or "problem finding" which occurs in adulthood along with the use of dialectical operations in which this cognitive operation is perfected (Riegel, 1973; Arlin, 1976). There is evidence that the cognitive and behavioral synthesis of developmental dimensional conflicts does take place in the everyday lives of persons over 60 and that the ability to make such a synthesis is adaptive for their functioning by allowing them to make decisions (Sinnott and Guttmann, 1978). The period of dialectical operations or problem finding, even in its currently ill-defined state, suggests ways of approaching the developmental events in mature adulthood, events which may prove to be adaptive for the survival of the mature adult or elder. However, this approach to valid measurement of adult abilities, like the others described, is still in its own infancy.

The models which underlie psychology's thoughts on lifespan intellectual development have been generally borrowed from the study of the intellectual development of children and are largely organismic in nature (Kuhn, 1978). This has been a problem in generating new thought about the developmental events of life after adolescence, when it is difficult to tie development to significant, general organismic changes. Since organismic change does certainly occur in the process of dying, it has been relatively easy to think in terms of significant intellectual changes of a analogous negative type occuring at that time of life. If, on the other hand, intelligence itself is conceptualized as an independent adaptive, biological mechanism (Piaget, 1971), adaptive intellectual activity in old age and maturity could be a factor that aids survival in spite of organismic physical decline. If one presumes that intelligence serves an adaptive purpose in childhood, one should at least be willing to test that assumption for other periods of the lifespan. It would also be desirable to investigate how intellectual activity (from a Piagetian point of view) is rechecked against reality after elaborate formal operational systems have been logically devised. How does the knower synthesize the logically elegant formal operational system and the logically inelegant daily experience/activity in a formal assimilation/accommodation? Such constant rechecking offers a place for experience to impact directly on more complex structural formation later in life.

The gaps in current theories of lifespan intellectual development are readily apparent. There is no ecologically satisfying, complete theory in current use. Lifespan intellectual development is forced, conceptually, into an organismic model and measured by tasks designed for a less-experienced age group with different adaptive needs. The cognitive complexity of adult social cognition has been largely overlooked in assessing adult intelligence. Theorists are only beginning to approach adult intellectual development as a real event which is a result of adaptation to both organismic and interpersonal imperatives and needs, and which may entail intellectual skills which are more complex than those demanded of children and young adults.

Adults themselves feel that they can define the nature of intelligent behavior in adulthood. As part of an ongoing study (Sinnott, in preparation[1]) persons in early adulthood (20's and 30's), middle adulthood (40's and 50's)

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[1]Sinnott, J.D. How adults define "intelligence in adulthood." Paper in preparation, 1978.

and mature adulthood (60 or over) responded to open-ended questions concerning the skills needed by persons at various stages of adulthood and the behaviors that would be considered intelligent at those stages. Virtually every respondent to date has mentioned interpersonal skills as important at every stage in adulthood, irrespective of the respondent's age, sex, or level of education. "Intelligence" in adulthood at every stage virtually always included the ability to understand and deal with the complexities of interpersonal events, again irrespective of the respondent's age, sex, or level of education. Respondents also frequently mentioned skills and behaviors related to adaptation to changing life events and to coping. These preliminary suggestions about the nature of adaptive adult intelligence would suggest a turning away from traditional models to a social-cognitive approach which incorporates aspects of dialectical and Piagetian theories with the recent suggestions of Schaie.

It is this author's contention that a post-relativistic approach (Sinnott, 1978) to a theory of lifespan intellectual development will help to fill some of the gaps in models and knowledge and resolve some of the contradictions mentioned above. Such a model will be outlined later in the paper.

Piaget's and Riegel's Theories

Two theories have proved useful in describing development, and will be used as the starting point for the proposed model of lifespan social-cognitive development: that of Piaget and that of Riegel. In Piagetian theory, which is widely known and discussed, knowledge is based on the progressive coordination of the individual's own actions on reality (Piaget and Kamii, 1978). The actions in question are not only material actions, but also the interiorizations of material actions and the abstractions from the interiorizations. The coordinations, or structures, are constructed by developing individuals themselves during a process in which new experience is assimilated to present structures, and the structures accommodate themselves to the actuality of new information (Piaget and Inhelder, 1969). Since the structures are not only indications of "what an individual can do" with a given situation physically or mentally but also indications of how individuals come to know their worlds in an adaptive manner, Piaget's developmental theory is also a theory of genetic epistomology whose main interest is in a difficult set of questions; how is knowledge acquired? How does it increase? How does it become organized and reorganized. Piaget's work focuses mainly on the development of operations for knowing physical reality (Piaget and Kamii, 1978), although the theory need not be confined to the understanding of physical relations. According to Piagetian findings (summarized in Furth, 1969; Piaget and Inhelder, 1969), the developing child passes through the following stages of cognitive growth at an individual rate in an invariant order: sensorimotor; preoperational; concrete operational; and formal operational.

Riegel has been the main spokesperson for the dialectical interpretation of human development (1973; 1975a; 1975b; 1976; 1977a; 1977b; 1978). The dialectical interpretation has recently been applied to memory, clinical psychology, social logic, decision making, language, sex role development, moral judgement, ego development and paradigms

in psychological research. The dialectical method of analysis applies dialectical logic, to a behavioral event. Its primary emphasis is on change and activity, rather than on stability and permanence, and behavior is analyzed as a part of a time/experience continuum. Dialectical operations may take the form of a dialogue between individuals or of a dialogue within the individual. Contradictions and their syntheses are emphasized in examining the short-term or long-term development of the individual-in-society, or of society itself (Riegel, 1976). The conflicts between developmental dimensional progressions (biological, psychological, social, or environmental) are thought to be the impetus behind lifespan development, including development in old age (Riegel, 1976; 1977). No event can be described free of the influence of its place in the time continuum (Riegel, et al., 1978).

The dialectical analysis of development is related to many of the concepts of Piagetian theory. There is agreement that Piaget's concepts of assimilation and accommodation represent two aspects of a behavior event which seems to possess dialectical qualities (Youniss 1974). A combination or synthesis of these two aspects is present in every act of knowing, according to Piagetian theory (Furth, 1969). Both Piagetian studies and dialectical studies focus on transitions (dialogues) leading to equilibrations or syntheses (Piaget and Kamii, 1978; Riegel, 1976; Youniss, 1974). In Piagetian theory, initial noncorrespondence between figurative and operative elements (thesis/antithesis) in cognition are the impetus for further cognitive development (Furth, 1969). In the past, Piagetian research focused more on the equilibration itself, more on child development, and more on the knowing of physical relationships; dialectical theory more often focused on the nature of the transition processes, on lifespan development, and on development as a historical event. In their separate ways, both Piagetian theory and dialectical theory seem to rely on the ongoing history of contradictions and equilibrations to explain the development of the individual's knowledge about the world.

Since these two theories are dominant forces in developmental psychology today, and since they are equipped to make statements about the multifaceted nature of genetic epistomology, they will be used to organize some thoughts about lifespan social cognitive development. Results obtained using the model might then be related to work based on the two major theories. Knowledge from studies utilizing the proposed model will contribute to Piagetian formulations about the epistomology of social relations, and will partly specify the two-way relations between the individual's cognitive development and social institutional organization. Knowledge from studies utilizing the proposed model will contribute to dialectical theory by providing a mechanism for the internalization of the dialogue (which as yet is not formulated; Riegel, private communication, 1977) and describing some cognitive elements in the synthesis of conflicting developmental dimensions.

The Model Itself: Dynamics Within Each Social Knower

The following tentative description of the way in which an individual might know interpersonal relations is mainly a Piagetian/dialectical one. It is focused first on dynamics in each knower. The main subsystems to be described are the knower's interpretive system (composed of 5 levels) and

the individual/group dialectic system (composed of 3 orientations.) The model is capable of describing the development of social cognition through the entire lifespan, as well as describing the epistomology of relativistic relationships themselves.

1. The interpretive system is defined as series of knowing structures distinguised by increasing structural complexity, inclusiveness, and numbers of relations explained. Piagetian-type research into social-cognitive domains has often demonstrated an ordered cognitive structure to moral and ego development. Such a structure often consists of the characteristic operational levels noted by Piaget and Inhelder in their studies of cognitive development (1969). It is expected that this will be the case here, and that an ordered cognitive structure will be found.

An interpretive system makes sense in view of the many organismic elements found to be associated with social-cognitive development, and in view of the suggestions by Schaie (1977-78) and others that the intellectual development of adults, when it takes place, appears to center on social tasks. A Piagetian point of departure was chosen because it best reflects the view that intellectual development of any type at any age is an adaptive strategy of the organism (Piaget, 1971). The model is not meant to describe levels as such, since the levels are not stable and are hierarchical only at acquisition. The dynamics to be described later are as concrete as the levels, which are merely points in the dynamic change frozen in time. A social behavior would only be understood at the knower's level of interpretive complexity, through which it is filtered or assimilated, in Piagetian terms. As in Piagetian theory (Piaget and Inhelder, 1969), the conflict between aspects of the experience and aspects of the knower's structures would be the genesis of changes in the structure ("accommodation") and subsequent changes in the mode of future perceptions of the same event ("structural development"). Changes in the knower's structures would have an additional effect not discussed by Piagetian theory. Behavior based on a structure which imperfectly mirrors social reality would appear to lead to changes in the social reality itself as Lerner has suggested (1978). The process would be similar to that of a dialogue, as described by Riegel (1975). Both social knower and social reality would change from encounter to encounter.

What might be the stages of complexity of the interpretive system which may be used by adults in social cognition? Let us hypothesize that the adult has available five levels of interpretation which correspond in very general ways to the Piagetian stages of (I) sensorimotor thought; (II) preoperational thought; (III) concrete operation thought; and (IV) formal operational thought; plus the addition of another stage suggested by Van den Daele's (1975) model of ego development and by dialectical theory: (V) metatheoretical thought. The fifth stage is added to the four Piagetian-type stages in order to provide a categorization for the type of thought which will result when the adult accommodates extensive, logical formal operational systems to everyday reality, and presumably, finds that several mutually-contradictory ones comfortably co-exist. This stage defines the acquisition of concepts of relativity. I. Sensorimotor-level interpretation will be defined (as in Piagetian theory) as understanding at the level of basic needs and gut-level reactions, without inclusion of a full-fledged symbol system. To extend the concept hypotheoretically, interpersonal relations at

the sensorimotor level might include that between the parent as food giver and the child as food taker. II. Preoperational-level interpretation will be defined as in an extension of Piagetian theory as the level at which relationships are beginning to be symbolized, but are still deformed by the egocentrism inherent in all the knower's thought. At this level, a child will perceive a parent as capable of only those relationships which the child currently has with the parent. For example, as some of Furth's young respondents commented (Furth, Baur, and Smith, 1976), "fathers can't be postmen, and postmen can't be fathers." III. At the concrete operational level interpersonal relations can be expected to be organized in terms of classes of relations and relations between relations. Types of relations can be subsumed under one another in a hierachy of relations as in Piagetian theory. An adult may have several different relationships (e.g., parent, physician, friend) to a child, all subsumed under a nurturant relationship which has been further subdivided into nurturant-authoritarian and nurturant-equilitarian types of relationships. IV. At the formal operational level, one expects to find systems of interpersonal relations structured in a logical system like that employed by persons at the (physical) formal operational level. The parent-child relationship might be viewed at this level as part of a set of possible relationships possible within a nuclear family system. V. Finally, at the metatheoretical level, one might be expected to interpret an interpersonal relationship as part of any number of equally logical systems of relationships, systems which may contradict each other. One may understand a parent-child relationship as a manifestation of several ways of looking at reality, or of 2 philosophical systems, which while they systematically contradict each other, may both be valid in reality. When the child slaps the parent, the parent may view him/her as possibly a "nobel savage" (who has been warped by bad experiences) or as a "tabula rasa" who needs the guidance of a concerned adult. In either case, whatever the philosophical basis the parent may react in the same way (holding the child's hand, so that she/he does not hit again). Stages are described in Figure I.

One aspect of the tentative model is that any social or interpersonal behavior can be filtered or encoded in terms of any level of thought just as any physical phenomenon in Piagetian theory can theoretically be assimilated to a sensorimotor structure, a concrete operational structure, or a formal operational structure. Of course the quality of the information received will be a function of the type of structure receiving it. Person perception literature also indicates that a behavior is interpretable in line with many different "naive theories" held by the "judge". An interaction can be understood either at or below the knower's level(s) of interpretive complexity; this element is drawn from the dialectual perspective, and is seldom held true by Piagetians. It appears to also be verified by studies of selective modelling effects. (See Tinbergen, 1974, for an example of adults' application of relational structures of a lower level to "match" those of a child with whom they wish to begin a relationship.) Incongruity between the knower's interpretation of the relation and the encoded complexity of the relation will be expected to lead to changes in the knower's structures of thought just as in Piagetian theory the child's interaction with experience potentially orderable in complex ways leads to changes in the child's at first simple operations. We can also expect changes in the next link in the chain of behavior based on the original interpersonal event

because of the knower's altered thinking about it. Both the event and the knower's structures will be expected to determine how the event is known, which will determine the resulting (next) interpersonal event, which, in turn, determines the complexity of the next encoded interaction. It is expected that three dialogues (as in Riegel's view) will have taken place: one within the first knower's structures; another within the second knower's structures; and a third between the structures of the first knower and the second knower. Both participants will be expected to have changed, if development goes smoothly, as a function of past organismic states and experiences.

The Model Itself: The Individual/group Dialectical System

This system might be said to interact with the interpretive system of each knower. In this system, elements coming from the individual's motives, perceptions, needs, and already-existing structures will be said to constitute the A aspect of any interpretation. Elements coming from the pressure of the group, from environmental contingencies, or from already-established cultural goals will be said to constitute the B aspect of any interpretation. B-aspect elements may also be thought to come from perception of an interaction actually encoded at a level of complexity disparate to the receiver's level.

The individual/group dialectual system has been added to the model to more clearly describe the dynamics of change within each knower. There is evidence in the literature that what the individual brings to the social knowing experience and what is learned in a social setting are both important elements which need to be emphasized in any complete theory of either intellectual development or social development. Dialectical theory emphasizes what this paper would call the A aspect of Piaget's process, Piagetian theory actually stresses both A & B aspects--assimilation and accommodation. Although accommodation views the impact of experience from the point of view of the organism, it describes nonetheless the impact of elements extrinsic to the organism. A given social-cognitive structure may be primarily determined by A-aspect or by B-aspect at a given point, but it always involved with both.

A & B elements may be momentarily in opposition to one another, or may be coordinated and equilibrated as A/B for any structure. As in Piagetian theory, new actions might already be completely assimilable to existing structures without significant alteration in structures, or accommodations. As in dialectical theory, developmental dimensions might interface smoothly, without conflict. Thus, a structure at interpretive level III may be hypothetically described as either III-A, III-B, or III-A/B at a given point. For example, a person may interact with another who is at various times a parent and a physician, but always a nurturant person. The knower brings this III-A structure to a situation where the other is seen shouting at children in an angry and authoritative manner, and interaction in conflict with the original structure. Including this III-B element, the knower eventually succeeds in conceptualizing relationships as a more equilibrated III-A/B, awareness that the other person can relate as both nurturant-authoritative and nurturant-nonauthoritative.

Table I summarizes the 2-system social knowing process hypothesized

for one individual. The complexity of the development generally increases from left to right and from top to bottom on the figure. Development of social-cognitive capabilities would be expected to move from left to right on level I, left to right on level II, et cetera, until one is capable of a level V-A/B interpretation. In Table I examples of each vantage point are given in terms of the understanding of parent/child interpersonal relations, then in terms of peer/peer relations.

In a pilot study by Sinnott[2], in which children described interpersonal behavior in a group, the types of relations described ranged from level II to level III in the Table. The 8-year-olds generally gave level II/III responses, while the 12-year-olds gave level III/IV responses for the most part. The older children demonstrated some awareness that the behavior of another person might be influenced by both A and B aspects, but the younger children appeared unaware of this.

The Model Itself: Dynamics Within the Social Knower and Between Two Knowers

There are two sources of change in the proposed operations within each adult social knower. Both sources of change stem from conflict. First, conflict exists between the potentially applicable structures which the individual brings to a social knowing event (A-aspect) and the group consensus of the structure for the social event (B-aspect). In both dialectical and Piagetian theory, these general types of conflict lead to development. In Piagetian theory, assimilation and accommodation are a part of every knowing act; in dialectical theory a thesis and antithesis underlie every synthesis. Van den Daele (1975) also posits both an interpretive (A) and a coercive (B) element in his theory of ego development. Aspects A and B of the Table could be considered two sides of a conflict leading to the equilibrium/synthesis represented by A/B. A and B are not separable in reality within the model just as (in Piagetian terms) assimilation/accommodation and (in dialectical terms) thesis/antithesis are inseparable in reality. Within the knower, one expects a striving for structural Aristotelean logical consistency at every stage but V since the cognitive domain of the knower would be analogous to the "limiting case" space of the Newtonian world view. As the level V structures develop, the focus shifts from equilibration to dialectical change as the stubborn inconsistencies between several high-level "limiting case" equilibrations become apparent. In terms of this model, Riegel's dialectical stage involves the relativistic general-case structuring of mutually-contradictory limiting-case equilibrations of a formal operational Piagetian type. Social activity on the part of the developing knower would logically be a likely source for the development of these skills since social experience can be "read" in so many ways.

The second possible source of conflict in this model is the high probability that in one knower any single coordinated social knowing structure is in conflict with some aspect of another social knowing structure. Again, this is an analog to assimilation/accommodation and to the thesis and antithesis concepts. The second source of conflict would come from the supposed relativistic nature of social reality (in comparison with physical reality).

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[2]Sinnott, J.D. Children think about relations in groups. Paper in preparation, 1978.

In spite of our limited knowledge of structural development, it is generally presumed that, in Piagetian terms, an equilibrated structure for knowing physical reality can easily logically coordinate with other equilibrated physical knowing structures. In social knowing, on the other hand, one suspects that concept of relativity is intrinsic at every level. Interpersonal relations change moment to moment. We do not seem to completely order them even after years of experience, although our understanding deepens and we apply incomplete structures to get by. It appears to be especially easy, then, for even equilibrated structures of social knowing to conflict with one another, generating ever more complex reorganizations.

Every A/B structure in Table I, then, has the potential in the model for conflicting not only with every A-type structure, or every B-type structure (the unequilibrated structures-in-transformation), but with other A/B-type structures too. These conflicts lead to further attempts at equilibration or synthesis.

The process that was described above is hypothesized to take place in each social knower. Each produces actions which are a result of his or her level of interpretation and the environmental contingencies available. During a social interaction, each person's behavior--already based on understanding filtered through his or her own knowing system--is "received" by another, who of necessity filters it through a second knowing system. Since interpersonal behavior will be based on social reality as filtered, the same event may be presumed to have as many interpretations as there are participants, and may therefore lead to as many different social behaviors as there are participants. This aspect of the model differs from both Piagetian and dialectical theories. Piagetian theory has typically dealt with objective physical knowns which are not directly affected by the knower, so that this effect need not be taken into account. While dialectical theory - as expressed in dialogue analysis - does acknowledge the effect of each dialogue participant on the resulting perceived dialogue, it does not spell out the same process in describing the interface between developmental dimensions.

Each interaction between two social knowers would also numerically increase the chances for development within each knower's structures. In each knower, any A-type structure can conflict with any B-type structure on a given level. Also, any A/B type structure can conflict with any A or B on any of the five interpretive levels. Wherever the "receiver" is located in his or her structural grid (Table I), the odds are that the "sender" is speaking or acting from structures with different coordinates. The disparity can lead to growth. For one thing, in the course of events several different changing "realities" about a single interpersonal relation will need to be assimilated to the receiver's structures. To have the (Aristotelian) logical disparity resolved in one's own limited case would require developing transforms to relate the coordinates on one's social-cognitive grid to coordinates on others' social-cognitive grids while both knower and known are in constant developmental transition state. In other words, to develop usable interpersonal skills, one must develop structures of relational relativity analogous to the structures used by science to understand post-Newtonian physics.

When person #2 replies, the odds are that the reply will come from a grid location different from person #1's starting location. Continuous restructuring will result, just as physical operations in Piagetian theory lead to continuing growth in physical structures. The dynamics include both conflict, stressed by dialectical theory, and equilibration, stressed by most adherents of Piagetian theory.

Insert Figure 1 Here

For example, to illustrate the dynamics beginning with the case in Figure 1, let's say any person #1, a women in her 50's, acts from a III-A/B structure ("I've always been a housewife and mother") and that action is received by person #2, a woman in her 40's, on a IV-A level. Person #2 then responds on the IV-A level, sending a IV-A response ("You can get a job in today's society"). If person #1 tries to receive the response at her III-A/B level, there will be a conflict ("I can't get a job - I'm a housewife/mother. But she says there's more then one way to live..."). In trying to coordinate III-A/B with IV-A, the structures of person #1 develop. Let's speculate further that the result is the IV-A ("In this society I can be a mother/housewife and a worker.") response by person #1 who begins to assess her social relational possibilities within a complete formal binary system. This is easily received by person #2, since IV-A is already her current dominant level of social knowing in this area. The two women now seem to "see eye to eye," or "know where each other are coming from"...at least in this content area. If they interact on another content area, they may not be operating at the same level. Nothing has transpired to change person #2's thinking, although she might have begun to express thoughts about roles from another point of view under other circumstances and contingencies. Note that the two women may not really be in accord because the social-cognitive structural grid of one may be very different in size and shape (in meaning) from the grid of the other. The women have used words with basic shared meanings as transforms to describe and relate two sets of coordinates-in-motion. If they continue to relate, the grid of one will more and more be "reshaped" by the presence of the thoughts of the other.

Let's now complicate matters by putting the two women into a group with three others who have been attending the same meeting and have joined the interaction after the event discussed above. When the newcomers join them, the first two women are "seeing eye to eye" at level IV-A. The first newcomer (who is II-A/B on this topic: "All my good friends are housewives and mothers, only, like me") tries to receive what the first two say at her own level, disequilibrating her II-A/B structure ("Are these two my real friends? Is there another way to look at women's roles?") Meanwhile, the second newcomer, having attained more complex structural development in this area, received the discussion of the original two women on a V-A level. ("The real issue is more than whether housewives/mothers can be workers too. The real issue is, can any society logically tolerate free choice of roles?") The third newcomer, meanwhile, thinking of other things, "hears" and responds at a gut-level I-A/B ("I'm tired of thinking about women's roles. Why doesn't somebody here tell me what a good job I'm doing? I want someone to care."). A lively interaction ensues due to structural disparity. Many outcomes are possible. When the smoke clears, the original two women have remained at IV-A in their thinking; the first newcomer has restructured from II-A/B to III-A/B; the second newcomer has assumed a level IV-A out of empathy with the original two (in spite of possessing a more complex

interpretive ability). The last newcomer has gone through the motions of a IV-(B) response, which she does not understand, but which she "learned" today. Each participant has changed on the basis of both previous structures and the current event. The group is now acting on a single level - or close to it - for the time being. Barring change, the group has created a social consensus that was originally the understanding of only one person, the 40-year-old woman. Restructuring of cognitive structures created a social relational reality which differed from the social relational reality which originally existed for the participants. Some of the participants have really restructured; others have only altered what Piagetian theory would call figurative, or superficial aspects of their understanding, perhaps parroting what they learned was the "correct" response.

With reality changing in this manner from event to event, the epistomology of social events seems more complex than that of physical events. A given event is both level III and level IV simultaneously in reality because interpersonal relations seem to be produced by the participants. It is not surprising that social relationships would be increased, refined, and brought to cultural complexity only in adulthood. When the known is constantly changing, demands on the organism for flexibility increase tremendously. Mechanisms for dealing with the complexity of recombinations of structures, due to increasing social experience and roles during adulthood, allow the adult to experience the "richness" in social relations that come with maturity. Each social knower helps develop the cultural complex which, in the person of other individuals, further develops the social cognitive structures of each social knower. Actions based on consenses on social-cognitive structures may very well lead to the development of social institutions. Institutions would be in a position of exerting much more powerful "B" effects than single individuals. Hence, they would be in a position of "perpetuating themselves" by means which include the sharing of verbal transform systems.

An Observation in Support of the Model

Adult Social Cognition as Expressed in Dialogues

If social cognition develops through interpersonal interactions leading to structural growth, it would be expected that two-person dialogues focused on interpersonal relations would contain evidence of this process. Adults would interpret others' statements in light of their prevailing level of interpretation; mature adults would demonstrate some high-level elements in their statements; speakers utilizing different levels of statements would be perceived to be "in conflict" if they did not restructure toward level convergence; pairs of individuals continuing relationships would be expected to converge at a common level of social-cognitive interpretation.

A preliminary exploration was made to see if these expectations would hold true. Content analyses were performed on two-person dialogues recorded from selected dramas--a movie ("Tom Jones"), three soap operas ("Doctors", "Search for Tomorrow", "For Richer for Poorer"), and an adult situation comedy ("All in the Family")--selected because they were likely to contain dialogues involving social cognition, and because each, in its own genre, contained dialogue which was considered "realistic". From

two recorded hours of this material 25 two-person dialogues of various lengths focusing on the understanding of interpersonal events were found and analysed. Dialogues were defined as the verbal interchange between two persons responding to each others' statements with other statements. Each statement (or group of statements) made by a speaker was scored as defined in Table I in terms of the social-cognitive level it represented; the highest level of statements made by an individual speaker in the course of all his/her statements was also recorded. The following are some examples of statements at various levels of understanding: 1) "Come back to me, John, I need you desperately"; 11) "You're my son, and no matter how old you are you'll do what I tell you!"; III) "I've been working so hard I think I put Joe (husband) in second place in my life"; IV) "You cannot disgrace your family by marrying a bastard. It's unthinkable! You are of noble birth"; and V) "I know I should put him out in the street because of his base birth, but, Vicar, as a Christian I should show him charity and kindness".

Overall, statements ranged from level I to level V. Of 29 adult speakers, 21 made statements indicating a level V awareness of the relativistic nature of social relational structures; however, they made statements indicating lower levels most of the time. Very few conversations were held entirely at one level of understanding (3 of 25), and these were brief exchanges. Seven of the eight persons never making a level V statement were young adults in their teens or early twenties; only two young adults of nine made a level V statement.

In an attempt to see whether each speaker would interpret the statements of the other from his/her own level, the first and second statements of speakers were examined. The result was a bell-shaped distribution with 52% of speakers maintaining the same level in their second statement, 15% moving up one level, 15% moving down one level, the remaining 18% divided at the extremes. From the beginning to the end of the dialogues, 39% of the pairs moved on the average one level closer together in understanding, 39% remained at the same comparative distance from one another, and 21% moved one level further from one another, even though in the course of the dialogues pairs were often as much as 4 levels apart. Pairs in ongoing relationships in the drama itself ended their dialogues as close or closer in understanding then they started, but this was not generally true for other pairs not in ongoing relationships.

The levels of 4 older and 4 younger characters of both sexes who appeared in several dialogues were examined to determine if the mature adult characters gave evidence of structuring social cognitions on a higher level than the younger ones did. The first young man gave 50% level I comments, 37.5% level III and 12.5% level IV; the second gave 50% level I, 40% level II, and 10% level V; the first young woman gave 32% level 1, 37% level III, 21% level IV, and 10% level V; the second gave 25% level I, and 75% level III. This contrasts with the statements of the four older individuals. The first older woman gave 47% level III statements, 40% level IV, and 13% level V; the second gave 14% level I, 38% level III, 24% level IV, and 24% level V; the first older man gave 8% level 1, 36% level II, 14% level III, 21% level IV, and 21% level V; the second gave 25% level I, 8% level II, 25% level III, 34% level IV, and 8% level

V. In general, lower-level statements predominate with the younger characters while higher-level statements predominate for the older ones.

While the data reported above represents only a pretest of the concepts in the proposed model, it still points to the preliminary conclusion that complex, relativistic understanding the structure of social relations is an event in adult development demonstrable from behavior. This preliminary evidence suggests that the knowers themselves may help determine the impact of the stimulus environment to create their own social knowing milieu from moment to moment. A long-term association between social knowers is related to their accommodation of each others' understanding of social relationships. The individual seems to perceive a statement related to the structure of social relations at his/her level of understanding. Although this preliminary data follows from a relativistic conceptualization of development, the analysis above is not as rich as it would be if longer-term information were collected and relativistic analysis done to determine nearness in age/experience intervals, interpersonal space configurations, and the direction, rate and quality of interval change.

Adult Development as a Social Cognitive Phenomenon

Many of the behaviors most characteristic of adult development can be operationalized, tested, and discussed in terms of life-span social-cognitive development. Empathy, disengagement, wisdom, integrity, personal continuity prejudice, age-status norms, egocentrisms in old age, rigidity--even the decline of scores on standardized intelligence tests--appear to be aspects of this development. Only one approach to adult stages of development will be discussed here.

The final stage of adult cognitive development mentioned by Schaie is the reintegrative stage (old age). This stage may be viewed as a reaction to decreasing biological capabilities and to the individual's knowledge of impending death. From a positive point of view, the adult may wish to achieve closure and to integrate structures at the end of life. The elder's experience at this point may be extensive enought to accomplish such an integration. Research on this stage may examine the relationship between physical decline and the threshold for overstimulation, or physical decline and the complexity of social-cognitive restructuring. Another interesting investigation could center on the social-cognitive flexibility of an individual and the likelihood of that elder experiencing Erikson's integrity, or overall personal structural closure.

Schaie (1977-78), Riegel (1975), and Piaget (1972) have suggested that adult competence might most appropriately be measured with tasks based on adult experience. The most appropriate measures of adult cognitive abilities appear to come from the domain of adult social cognition and therefore from adults' understanding of relativity. Social-cognitive competencies which might be investigated and tested include: (1) the ability to structure interpersonal relations at the concrete operational and the formal operational levels; (2) the ability to understand and utilize relativistic concepts (in other words, to mainfest completed formal operational structures and complex dialectical processes); (3) the ability to use metatheories to interpret interpersonal relations within social systems rather than within only simple

social units; (4) the ability to integrate interpersonal relations knowing structures to achieve personal integrity at the close of life; (5) the ability to deal adaptively with over-stimulation and understimulation; and (6) the ability to deal adaptively with social-cognitive conflict. Measures developed through such social-cognitive investigations will be more in line with intellectual competence and development of mature adults than current assessment tools are. They will be based on developmental dimensional interface, as Riegel (1976) has suggested. Such measures would also be more motivating for adult respondents, and would not be based on simple social learning and informational increment measures.

Lifespan Identity

If developing, intelligent adults increasingly perceive the relativity and complexity of interpersonal reality, this knowledge would have an effect on self perceptions, including the perception of identity. Only adults who have not developed would be able to retain, unmodified, the identity they developed as adolescents. Identity would appear to shift as perceived relations in the social and physical world shift. Adult identity might best be defined as "an abstracted concept of the self in relation to the current flux of relativistic relationships in the social and physical milieu." The adaptive, fully intelligent developing adult would possess a complex, flexible identity, able to integrate many polar roles, interpersonal relations, and conflicting self-concepts. Such a level V identity appears to underlie Erikson's definitions of integrity, as well as many concepts of successful aging. A measure of this type of identity would be an indirect, complex, overall measure of intellectual competence in later adulthood, since such a measure of identity would appear to summarize social-cognitive development.

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TABL

Vantage Points in the Social Cognition Process (Examples
by child; 2) parent/child relations as i

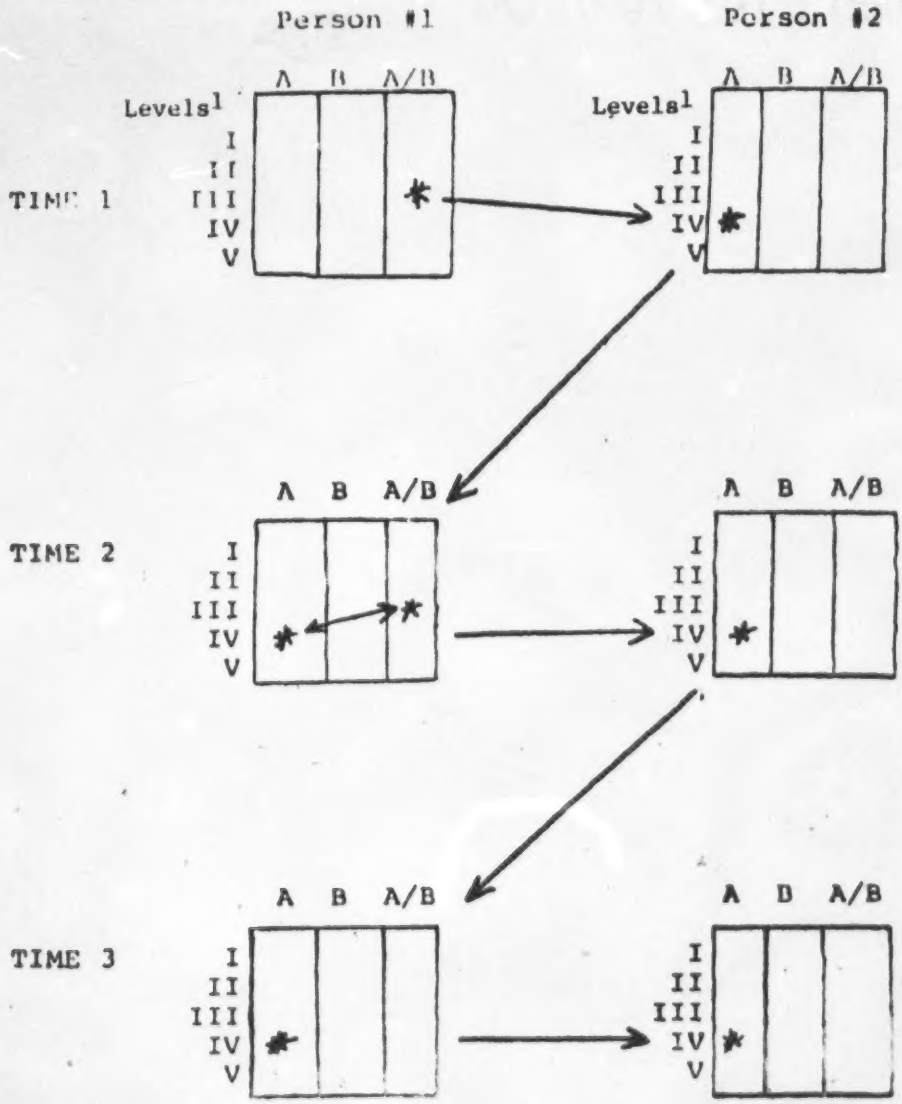
	1) Child-parent	Individual/G
	A	B
Interpretive Complexity	Overdetermined by knower-previous structures	Overdetermined by group-"new information"
Level I Sensorimotor: Based on need, or gut-level reactions; non-mutual relations.	Parent gives food, warmth, to child.	Parent acts in non-nurturant way with child.
Level II Preoperational: Ego deformed relations; single roles occur; non-mutual relations.	Parent is only a "parent," no other role, since that is the only relation with parent experienced by child.	Parent relates to child in some non-parental way.
Level III Concrete operational: Relations are classified; relations between relations; mutual relations possible.	Parent is "parent," "doctor," "friend" to child at different times.	Parent can be either authoritative or non-authoritative "parent," "doctor," or "friend" in relation to child.
Level IV Formal operational: Logical systems of relations; mutual relations possible.	Parent relates to child as part of a nuclear family system which has logical consistency and certain logical possibilities.	Parent/child relations can occur within a communal system which also is an internally logically consistent social system.
Level V Metatheoretical: Systems of structured systems relativistically applied; mutual relations possible.	Parent/child relations occur within a given philosophical system, with its own relativistic logic, which might encompass several contradictory logical social systems.	Similar parent/child relations can occur within a logically consistent alternative philosophical system which conflicts with the previous one (in the A aspect).

given in terms of: 1) parent/child relations as interpreted
rpreted by parent, 3) peer-peer relations

p Emphasis	2)Parent-child	3) Peer-[illegible]
A/B	A/B	A/B
Temporarily equilibrated-a new A-state	Temporarily equilibrated-a new A-state	Temporarily equilibrated-a new A-state
Parent has both nurturant and non-nurturant relationships with child.	Parent conceptualizes child as gratifier of needs or as maker of demands.	Peer conceptualizes peer as gratifying needs or giving pain.
Parent can relate to child as "parent" and in different roles.	Child seen as extension of parent; his/her actions reflect on the parent's identity.	Peer sees peer as extension of self, and expects total "togetherness" for the relationships to continue.
Parent's relations with child can form a hierarchical classification system.	Child viewed by the parent within a hierarchy of roles.	Peer sees peer as capable of many roles-spouse, friend, co-worker-in relation to him/her.
Parent/child relations are expressed in a single logically-consistent formal social system.	Child seen as presently or potentially assuming a complex of social roles in one given system; parent begins to treat child accordingly; role complex seen as a logically structured whole.	Peer sees peer as embedded in system of relationships with many others; such system seen as a logically structured, whole social system.
Philosophical systems which underlie childrearing systems may be mutually contradictory, but may still result in viable parent/child relations based on an application of understanding of the relativistic nature of social relational systems.	Child seen as presently or potentially embedded in several mutually-contradictory systems of social roles; child may be attempting to conform to both parents' lifestyle and a contradictory counterculture lifestyle simultaneously.	Peer seen as presently or potentially embedded in several mutually contradictory logical systems of social behaviors; s/he may be acting on a model of social determinism and rugged individualism simultaneously, although the two are contradictory in theory.

FIGURE I

Changes in each knower and in the interpersonal event due to conflict generated by the multiple filter system



[1] Interpretive Complexity

Level I - Sensorimotor: Based on need, or gut-level reactions; non-mutual relations.

Level II - Preoperational: Ego deformed relations; single roles occur; non-mutual relations.

Level III - Concrete operational: Relations are classified; relations between relations occur; mutual relations possible.

Level IV - Formal operational: Logical systems of relationships; mutual relations possible.

Level V - Metatheoretical: System of structured systems; mutual relations possible.